Docket No. GROU-011

# APPLICATION

## FOR UNITED STATES LETTERS PATENT

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## SPECIFICATION

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN THAT I, **Ronald J. Hoffart**, a citizen of the United States, have invented a new and useful sliding quick attach system system of which the following is a specification:

# Sliding Quick Attach System

## CROSS REFERENCE TO RELATED APPLICATIONS

Two other utility patent applications are being filed with the USPTO simultaneously with this application identified by Attorney Docket Numbers GROU-010 and GROU-012.

## STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

Not applicable to this application.

## BACKGROUND OF THE INVENTION

### Field of the Invention

The present invention relates generally to implement attachment devices and more specifically it relates to a sliding quick attach system for allowing sliding movement of the implement while providing quick attachment and release of the implement.

**Description of the Related Art**

Conventional implement mounting arrangements have been in use for years for mounting various types of implements to tractors and like vehicles. Implements mounted to these structures range from loaders, blades, belly blades, rollers, brushes and the like. A typical implement mounting arrangement is the front-end loader commonly utilized upon small to large tractors. Another type of implement mounting arrangement is comprised of a belly structure that is attached beneath the frame of a tractor preferably capable of operating about various axes to provide lift, roll, pitch and yaw to an implement.

A conventional method of attaching implements to the implement mounting structure is by conventional fasteners such as pins and the likes. However, this mounting process is time consuming to attach and disconnection an implement. A solution to this problem has been developed utilizing "quick attach" devices.

A popular quick attach product is produced under the BOBCAT brand by INGERSOLL-RAND called the BOB-TACH SYSTEM (http://www.bobcat.com/products/att/index.jhtml). The BOB-TACH SYSTEM utilizes an upper hook structure that catchably engages an upper flange of the implement and a wedge structure that is extended through an aperture within a lower lip of the implement. The BOB-TACH SYSTEM allows for quick attaching and release of an implement. The main problem with the BOB-TACH SYSTEM is that it does not allow the implement to slide from side-to-side when attached to the loader.

While these devices may be suitable for the particular purpose to which they address, they are not as suitable for allowing sliding movement of the implement while providing quick attachment and release of the implement. Conventional quick attachment structures do not allow for sliding movement of an implement.

In these respects, the sliding quick attach system according to the present invention substantially departs from the conventional concepts and designs of the prior art, and in so doing provides an apparatus primarily developed for the purpose of allowing sliding movement of the implement while providing quick attachment and release of the implement.

## BRIEF SUMMARY OF THE INVENTION

In view of the foregoing disadvantages inherent in the known types of quick attach structures now present in the prior art, the present invention provides a new sliding quick attach system construction wherein the same can be utilized for allowing sliding movement of the implement while providing quick attachment and release of the implement.

The general purpose of the present invention, which will be described subsequently in greater detail, is to provide a new sliding quick attach system that has many of the advantages of the quick attach structures mentioned heretofore and many novel features that result in a new sliding quick attach system which is not anticipated, rendered obvious, suggested, or even implied by any of the prior art quick attach structures, either alone or in any combination thereof.

To attain this, the present invention generally comprises a support frame, a first brace and a second brace extending upwardly from the support frame, a catch member attached to the upper ends of the braces, a first latch structure and a second latch structure attached near opposing ends of the support frame, and an implement unit having an upper lip and a lower lip with at least one slot. The locking pin of the latch structure slidably extends within the slot within the lower lip of the implement unit for retaining the implement unit while allowing side-to-side movement of the implement unit.

There has thus been outlined, rather broadly, the more important features of the invention in order that the detailed description thereof may be better understood, and in order that the present contribution to the art may be better appreciated. There are additional features of the invention that will be described hereinafter and that will form

the subject matter of the claims appended hereto.

In this respect, before explaining at least one embodiment of the invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and to the arrangements of the components set forth in the following description or illustrated in the drawings. The invention is capable of other embodiments and of being practiced and carried out in various ways. Also, it is to be understood that the phraseology and terminology employed herein are for the purpose of the description and should not be regarded as limiting.

A primary object of the present invention is to provide a sliding quick attach system that will overcome the shortcomings of the prior art devices.

A second object is to provide a sliding quick attach system for allowing sliding movement of the implement while providing quick attachment and release of the implement.

Another object is to provide a sliding quick attach system that may be utilized with various types of implements including but not limited to blades, plows, brushes and the like.

An additional object is to provide a sliding quick attach system that may be utilized with various types of tractors and like vehicles.

Other objects and advantages of the present invention will become obvious to the reader and it is intended that these objects and advantages are within the scope of the present invention.

To the accomplishment of the above and related objects, this invention may be embodied in the form illustrated in the accompanying drawings, attention being called to the fact, however, that the drawings are illustrative only, and that changes may be made in the specific construction illustrated and described within the scope of the appended claims.

## BRIEF DESCRIPTION OF THE DRAWINGS

Various other objects, features and attendant advantages of the present invention will become fully appreciated as the same becomes better understood when considered in conjunction with the accompanying drawings, in which like reference characters designate the same or similar parts throughout the several views, and wherein:

FIG. 1 is a rear upper perspective view of the present invention with a blade implement attached.

FIG. 2 is a rear upper perspective view of the present invention.

FIG. 3 is a magnified upper perspective view of the latch structure.

FIG. 4a is a magnified upper perspective view of the latch structure fully engaged with the implement unit.

FIG. 4b is a magnified upper perspective view of the latch structure with the lever member released from the engaging portion.

FIG. 4a is a magnified upper perspective view of the latch structure with the lever member rotated thereby retracting the locking pin from within the slot of the implement unit.

FIG. 5a is a side view of the latch structure fully engaged with the implement unit.

FIG. 5b is a side view of the latch structure with the lever member released.

FIG. 5c is a side view of the latch structure with the lever member rotated thereby retracting the locking pin from within the slot of the implement unit.

FIG. 5d is a side view of the lower portion of the implement unit being rotated outwardly away from the latch structure for removing the implement unit.

FIG. 6 is a bottom view of the present invention supporting an implement unit.

FIG. 7a is a top view of the present invention with the implement unit being slid to the left.

FIG. 7b is a top view of the present invention with the implement unit being slid to the right.

## DETAILED DESCRIPTION OF THE INVENTION

### *A. Overview*

Turning now descriptively to the drawings, in which similar reference characters denote similar elements throughout the several views, FIGS. 1 through 7b illustrate a sliding quick attach system **10**, which comprises a support frame **60**, a first brace **70** and a second brace **72** extending upwardly from the support frame **60**, a catch member **74** attached to the upper ends of the braces, a first latch structure **40** and a second latch structure **40** attached near opposing ends of the support frame **60**, and an implement unit **20** having an upper lip **22** and a lower lip **24** with at least one slot **30**. The locking pin **50** of the latch structure **40** slidably extends within the slot **30** within the lower lip **24** of the implement unit **20** for retaining the implement unit **20** while allowing side-to-side movement of the implement unit **20**.

### *B. Support Frame*

As shown in Figure 2 of the drawings, the support frame **60** is an elongate structure having a lower edge. The lower edge is formed for slidably receiving an inner portion of the lower lip **24** of the implement unit **20**. The lower edge is preferably comprised of a flat and straight structure for allowing sliding movements adjacent thereto by the implement unit **20**.

As shown in Figure 2 of the drawings, a first brace **70** and a second brace **72** extend between the support frame **60** and the catch member **74**. The first brace **70** and the second brace **72** preferably have a connecting structure capable of connecting to a support structure such as a front-end loader. It can be appreciated that various other brace structures may be utilized within the present invention.

*C. Catch Member*

The catch member **74** is preferably comprised of an elongate structure as shown in Figure 2 of the drawings. The catch member **74** preferably is attached to the support frame **60** substantially parallel to the lower edge as further shown in Figure 2 of the drawings.

The catch member **74** is preferably comprised of a rod structure as best shown in Figure 2 of the drawings. The catch member **74** may have various cross sectional shapes, however it is preferable to have a circular cross sectional shape for the catch member **74** as shown in Figure 2 of the drawings. The catch member **74** preferably has a straight structure for allowing the implement unit **20** to slide upon the catch member **74**. It can be appreciated that the catch member **74** may be separated into two or more separate segments.

*D. Latch Structure*

As shown in Figure 2 of the drawings, at least one latch structure **40** is attached to the support structure for securing the implement unit **20**. As shown in Figure 2, it is preferable to have two opposing latch structures **40** attached to the support frame **60**, however various other numbers and combinations of latch structures **40** may be utilized.

The latch structure **40** preferably has a housing structure that slidably receives a locking pin **50** having a tapered portion **52** as shown in Figure 3 of the drawings. The locking pin **50** extends through an opening within the support frame **60**. The locking pin **50** preferably has a rectangular cross section for being slidably received within the slot **30** of the lower lip **24**. The locking pin **50** has a width slightly smaller than a width of the slot **30** as best illustrated in Figure 5b of the drawings.

The latch structure **40** further includes a lever member **42** attached to the locking pin **50** via a connecting member **46** for manipulating the locking pin **50**. The connecting member **46** extends through an opening within the housing of the latch structure **40** and is attached to the locking pin **50**.

A lever member **42** is movably attached upon the connecting member **46** as shown in Figure 3 of the drawings. The lever member **42** has a handle portion and a leverage portion that selectively engages the support frame **60** for allowing the user to manipulate the position of the locking pin **50**.

A bias member **48**, preferably a compression spring, is attached between a broad head of the connecting member **46** and the leverage member for applying an inward force to the leverage member. The latch structure **40** includes a cutout forming an engaging portion **44** for securing the lever member **42** in a locked position. The bias member **48** retains the lever member **42** within the locked position within the engaging portion **44** as shown in Figures 2 and 5a of the drawings.

*E. Implement Unit*

The implement unit **20** may be comprised of any type of implement such as but not limited to a blade, plow, bucket, brush and the like. The implement unit **20** has a frame having an upper lip **22** and a lower lip **24** as shown in Figure 1 of the drawings. The upper lip **22** removably and slidably engages the catch member **74**.

As shown in Figures 5a through 5d of the drawings, the upper lip **22** has a shape similar to the shape of the catch member **74**, such as circular. The upper lip **22** has an opening for receiving and releasing the catch member **74** such as a hook structure. The upper lip **22** preferably extends along a significant length of the implement unit **20** to provide adequate support and sliding room for the implement unit **20**.

The lower lip **24** extends from a lower portion of the implement unit **20** as best shown in Figures 5a through 5d of the drawings. The lower lip **24** preferably extends a significant distance along the implement unit **20** as best illustrated in Figure 1 of the drawings. The lower lip **24** is formed for being slidably positioned adjacent the lower edge of the support frame **60**.

*F. Slot*

At least one slot **30** is positioned within the lower lip **24** as shown in Figures 1 and 6 of the drawings. The slot **30** extends longitudinally within the lower lip **24** and receives the locking pin **50** from the latch structure **40**.

As shown in Figure 6 of the drawings, the slot **30** preferably extends at least along fifty-percent of the length of the lower lip **24** to provide adequate sliding capabilities for the implement unit **20**. The slot **30** is also preferably comprised of a straight and elongate structure as further shown in Figure 6 of the drawings.

*G. Actuator Unit*

As shown in Figure 1 of the drawings, an actuator unit **62** is attached between the support frame **60** and the implement unit **20** for applying a side-to-side force to the implement unit **20**. The actuator unit **62** is preferably comprised of a hydraulic unit, however various other actuator structures may be utilized. The actuator unit **62** is connected to the implement unit **20** by a pin or other connection means that allows for easy disconnection and connection thereof.

*H. Operation*

With the implement unit **20** attached, the user is able to perform the normal four movements thereof: lift, pitch, roll and yaw. In addition to the normal four movements, the user is able to perform a fifth movement: sliding from side-to-side.

The user simply extends/retracts the actuator unit **62** to move the implement unit **20** to the desired side as shown in Figures 7a and 7b of the drawings. The locking pin **50** retains the implement unit **20** attached to the support frame **60** while sliding freely within the slot **30**.

To remove an implement unit **20** from the support frame **60**, the user first pulls upon the lever member **42** to release the same from the engaging portion **44** as shown in Figures 4b and 5b of the drawings. The user then rotates the lever member **42** upwardly thereby causing the locking pin **50** to retract from the slot **30** as shown in Figures 4c and 5c of the drawings. After the locking pin **50** is fully removed from the slot **30** within the lower lip **24**, the user may then pivot the lower portion of the implement unit **20** away from the support frame **60** as shown in Figure 5d of the drawings. After the lower lip **24** is a sufficient distance from the support frame **60**, the user may then either lower the support frame **60** or raise the implement unit **20** to disengage the upper lip **22** from the catch member **74**. To attach a new implement unit **20**, the above procedure is simply reversed.

As to a further discussion of the manner of usage and operation of the present invention, the same should be apparent from the above description. Accordingly, no further discussion relating to the manner of usage and operation will be provided.

With respect to the above description then, it is to be realized that the optimum dimensional relationships for the parts of the invention, to include variations in size, materials, shape, form, function and manner of operation, assembly and use, are deemed to be within the expertise of those skilled in the art, and all equivalent structural variations and relationships to those illustrated in the drawings and described in the specification are intended to be encompassed by the present invention.

Therefore, the foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.